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February 29, 2016

Illinois Department of Transportation
Kirk H. Brown, PE
Project Support Engineer
Division of Highways/Region 5/District 8
1102 Eastport Plaza Drive
Collinsville, Illinois 62234-6198

Subject: **Analytical Data for Soil Vapor Sampling According to Illinois Department of Transportation (IDOT) Permits No. 8-28548 and No. 8-28875**

Dear Mr. Brown,

AECOM, on behalf of Shell Oil Products US (SOPUS), is submitting the attached analytical results for soil vapor samples collected from the following vapor monitoring points in accordance with IDOT Permits No. 8-28548 and No. 8-28875:

- VMP-15
- VMP-55

If you have any questions or require further information, please contact Robert Mooshegian at robert.mooshegian@aecom.com (314/743-4106) or Michael Currier at michael.currier@aecom.com (314-346-9071).

Sincerely,
AECOM, on behalf of Shell Oil Products US

Michael Currier
Environmental Scientist

Robert E. Mooshegian, CHMM
Senior Program Manager

Attachments

cc: Kevin Dyer, SOPUS
Repositories – Roxana Public Works, Roxana Public Library, website
Project File

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2/23/2016
Ms. Elizabeth Kunkel
URS Corporation
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana Soil Vapor
Project #: 21563720.04204
Workorder #: 1511056CR1

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 11/4/2015 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1511056CR1

Work Order Summary

CLIENT:	Ms. Elizabeth Kunkel AECOM 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin AECOM P.O. BOX 203970 Austin, TX 78720-1088
PHONE:	314-743-4179	**P.O. #**	87243.UB
FAX:		**PROJECT #**	21563720.04204 Roxana Soil Vapor
DATE RECEIVED:	11/04/2015	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	02/19/2016		
DATE REISSUED:	02/23/2016		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
04A	VMP-55-5-110215	TO-15	8.5 "Hg	15 psi
19A	Lab Blank	TO-15	NA	NA
20A	CCV	TO-15	NA	NA
21A	LCS	TO-15	NA	NA
21AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 02/23/16

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 956
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
URS Corporation
Workorder# 1511056CR1

One 1 Liter Summa Canister sample was received on November 04, 2015. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified (0.2 ppbv for compounds reported at 0.5 ppbv and 0.8 ppbv for compounds reported at 2.0 ppbv) may be false positives.

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

Dilution was performed on sample VMP-55-5-110215 due to matrix interference.

Per client request, sample VMP-55-5-110215 was removed from original workorder 1511056A and reported separately in this workorder.

The workorder was reissued on 02/23/16 to remove a narrative reported previously as it is no longer applicable.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VMP-55-5-110215

Lab ID#: 1511056CR1-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	94	12 J	220	28 J
Carbon Disulfide	38	5.5 J	120	17 J
Methylene Chloride	94	5.6 J	330	19 J
Methyl tert-butyl ether	9.4	8.7 J	34	31 J
Hexane	9.4	41	33	150
Cyclohexane	9.4	29	32	100
2,2,4-Trimethylpentane	9.4	230	44	1100
Benzene	9.4	44	30	140
Heptane	9.4	32	38	130
Toluene	9.4	16	35	60
Ethyl Benzene	9.4	70	41	300
m,p-Xylene	9.4	16	41	70
o-Xylene	9.4	7.8 J	41	34 J
Cumene	9.4	51	46	250
Propylbenzene	9.4	100	46	490
4-Ethyltoluene	9.4	11	46	56
1,3,5-Trimethylbenzene	9.4	8.4 J	46	41 J
1,2,4-Trimethylbenzene	9.4	47	46	230
Butane	38	47	89	110
Isopentane	38	25 J	110	75 J

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Client Sample ID: VMP-55-5-110215

Lab ID#: 1511056CR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3110630r1**	**Date of Collection:**	**11/2/15 1:16:00 PM**
Dil. Factor:	**18.8**	**Date of Analysis:**	**11/7/15 07:05 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	9.4	Not Detected	46	Not Detected
Freon 114	9.4	Not Detected	66	Not Detected
Chloromethane	94	Not Detected	190	Not Detected
Vinyl Chloride	9.4	Not Detected	24	Not Detected
1,3-Butadiene	9.4	Not Detected	21	Not Detected
Bromomethane	94	Not Detected	360	Not Detected
Chloroethane	38	Not Detected	99	Not Detected
Freon 11	9.4	Not Detected	53	Not Detected
Ethanol	38	Not Detected	71	Not Detected
Freon 113	9.4	Not Detected	72	Not Detected
1,1-Dichloroethene	9.4	Not Detected	37	Not Detected
Acetone	94	12 J	220	28 J
2-Propanol	38	Not Detected	92	Not Detected
Carbon Disulfide	38	5.5 J	120	17 J
3-Chloropropene	38	Not Detected	120	Not Detected
Methylene Chloride	94	5.6 J	330	19 J
Methyl tert-butyl ether	9.4	8.7 J	34	31 J
trans-1,2-Dichloroethene	9.4	Not Detected	37	Not Detected
Hexane	9.4	41	33	150
1,1-Dichloroethane	9.4	Not Detected	38	Not Detected
2-Butanone (Methyl Ethyl Ketone)	38	Not Detected	110	Not Detected
cis-1,2-Dichloroethene	9.4	Not Detected	37	Not Detected
Tetrahydrofuran	9.4	Not Detected	28	Not Detected
Chloroform	9.4	Not Detected	46	Not Detected
1,1,1-Trichloroethane	9.4	Not Detected	51	Not Detected
Cyclohexane	9.4	29	32	100
Carbon Tetrachloride	9.4	Not Detected	59	Not Detected
2,2,4-Trimethylpentane	9.4	230	44	1100
Benzene	9.4	44	30	140
1,2-Dichloroethane	9.4	Not Detected	38	Not Detected
Heptane	9.4	32	38	130
Trichloroethene	9.4	Not Detected	50	Not Detected
1,2-Dichloropropane	9.4	Not Detected	43	Not Detected
1,4-Dioxane	38	Not Detected	140	Not Detected
Bromodichloromethane	9.4	Not Detected	63	Not Detected
cis-1,3-Dichloropropene	9.4	Not Detected	43	Not Detected
4-Methyl-2-pentanone	9.4	Not Detected	38	Not Detected
Toluene	9.4	16	35	60
trans-1,3-Dichloropropene	9.4	Not Detected	43	Not Detected
1,1,2-Trichloroethane	9.4	Not Detected	51	Not Detected
Tetrachloroethene	9.4	Not Detected	64	Not Detected
2-Hexanone	38	Not Detected	150	Not Detected

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Client Sample ID: VMP-55-5-110215

Lab ID#: 1511056CR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3110630r1**	**Date of Collection: 11/2/15 1:16:00 PM**	
Dil. Factor:	**18.8**	**Date of Analysis: 11/7/15 07:05 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	9.4	Not Detected	80	Not Detected
1,2-Dibromoethane (EDB)	9.4	Not Detected	72	Not Detected
Chlorobenzene	9.4	Not Detected	43	Not Detected
Ethyl Benzene	9.4	70	41	300
m,p-Xylene	9.4	16	41	70
o-Xylene	9.4	7.8 J	41	34 J
Styrene	9.4	Not Detected	40	Not Detected
Bromoform	9.4	Not Detected	97	Not Detected
Cumene	9.4	51	46	250
1,1,2,2-Tetrachloroethane	9.4	Not Detected	64	Not Detected
Propylbenzene	9.4	100	46	490
4-Ethyltoluene	9.4	11	46	56
1,3,5-Trimethylbenzene	9.4	8.4 J	46	41 J
1,2,4-Trimethylbenzene	9.4	47	46	230
1,3-Dichlorobenzene	9.4	Not Detected	56	Not Detected
1,4-Dichlorobenzene	9.4	Not Detected	56	Not Detected
alpha-Chlorotoluene	9.4	Not Detected	49	Not Detected
1,2-Dichlorobenzene	9.4	Not Detected	56	Not Detected
1,2,4-Trichlorobenzene	38	Not Detected	280	Not Detected
Hexachlorobutadiene	38	Not Detected	400	Not Detected
Butane	38	47	89	110
Isopentane	38	25 J	110	75 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1511056CR1-19A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3110606a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 12:00 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	0.12 J	2.0	0.51 J
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 1511056CR1-19A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3110606a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 12:00 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	0.093 J	21	0.99 J
Butane	2.0	Not Detected	4.8	Not Detected
Isopentane	2.0	Not Detected	5.9	Not Detected

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	114	70-130
1,2-Dichloroethane-d4	117	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: CCV

Lab ID#: 1511056CR1-20A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3110602**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 09:47 AM**

Compound	%Recovery
Freon 12	122
Freon 114	105
Chloromethane	134 Q
Vinyl Chloride	114
1,3-Butadiene	114
Bromomethane	107
Chloroethane	106
Freon 11	112
Ethanol	124
Freon 113	101
1,1-Dichloroethene	111
Acetone	112
2-Propanol	128
Carbon Disulfide	109
3-Chloropropene	112
Methylene Chloride	124
Methyl tert-butyl ether	108
trans-1,2-Dichloroethene	115
Hexane	116
1,1-Dichloroethane	121
2-Butanone (Methyl Ethyl Ketone)	123
cis-1,2-Dichloroethene	107
Tetrahydrofuran	134 Q
Chloroform	120
1,1,1-Trichloroethane	116
Cyclohexane	112
Carbon Tetrachloride	114
2,2,4-Trimethylpentane	122
Benzene	105
1,2-Dichloroethane	117
Heptane	99
Trichloroethene	104
1,2-Dichloropropane	109
1,4-Dioxane	108
Bromodichloromethane	109
cis-1,3-Dichloropropene	107
4-Methyl-2-pentanone	105
Toluene	106
trans-1,3-Dichloropropene	111
1,1,2-Trichloroethane	105
Tetrachloroethene	99
2-Hexanone	107

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Client Sample ID: CCV

Lab ID#: 1511056CR1-20A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3110602**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 09:47 AM**	

Compound	%Recovery
Dibromochloromethane	106
1,2-Dibromoethane (EDB)	106
Chlorobenzene	101
Ethyl Benzene	101
m,p-Xylene	103
o-Xylene	101
Styrene	101
Bromoform	101
Cumene	104
1,1,2,2-Tetrachloroethane	106
Propylbenzene	106
4-Ethyltoluene	102
1,3,5-Trimethylbenzene	98
1,2,4-Trimethylbenzene	101
1,3-Dichlorobenzene	100
1,4-Dichlorobenzene	97
alpha-Chlorotoluene	104
1,2-Dichlorobenzene	102
1,2,4-Trichlorobenzene	96
Hexachlorobutadiene	96
Butane	108
Isopentane	128

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	112	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCS

Lab ID#: 1511056CR1-21A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3110603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 10:11 AM**	

Compound	%Recovery	Method Limits
Freon 12	123	70-130
Freon 114	109	70-130
Chloromethane	124	70-130
Vinyl Chloride	116	70-130
1,3-Butadiene	112	70-130
Bromomethane	107	70-130
Chloroethane	109	70-130
Freon 11	116	70-130
Ethanol	122	70-130
Freon 113	99	70-130
1,1-Dichloroethene	107	70-130
Acetone	115	70-130
2-Propanol	128	70-130
Carbon Disulfide	95	70-130
3-Chloropropene	105	70-130
Methylene Chloride	122	70-130
Methyl tert-butyl ether	109	70-130
trans-1,2-Dichloroethene	98	70-130
Hexane	116	70-130
1,1-Dichloroethane	119	70-130
2-Butanone (Methyl Ethyl Ketone)	116	70-130
cis-1,2-Dichloroethene	122	70-130
Tetrahydrofuran	129	70-130
Chloroform	116	70-130
1,1,1-Trichloroethane	115	70-130
Cyclohexane	113	70-130
Carbon Tetrachloride	114	70-130
2,2,4-Trimethylpentane	122	70-130
Benzene	108	70-130
1,2-Dichloroethane	118	70-130
Heptane	104	70-130
Trichloroethene	109	70-130
1,2-Dichloropropane	110	70-130
1,4-Dioxane	110	70-130
Bromodichloromethane	115	70-130
cis-1,3-Dichloropropene	102	70-130
4-Methyl-2-pentanone	103	70-130
Toluene	106	70-130
trans-1,3-Dichloropropene	116	70-130
1,1,2-Trichloroethane	112	70-130
Tetrachloroethene	106	70-130
2-Hexanone	107	70-130

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Client Sample ID: LCS

Lab ID#: 1511056CR1-21A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3110603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 10:11 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	116	70-130
1,2-Dibromoethane (EDB)	112	70-130
Chlorobenzene	105	70-130
Ethyl Benzene	109	70-130
m,p-Xylene	109	70-130
o-Xylene	109	70-130
Styrene	103	70-130
Bromoform	109	70-130
Cumene	110	70-130
1,1,2,2-Tetrachloroethane	114	70-130
Propylbenzene	114	70-130
4-Ethyltoluene	108	70-130
1,3,5-Trimethylbenzene	102	70-130
1,2,4-Trimethylbenzene	105	70-130
1,3-Dichlorobenzene	108	70-130
1,4-Dichlorobenzene	104	70-130
alpha-Chlorotoluene	110	70-130
1,2-Dichlorobenzene	110	70-130
1,2,4-Trichlorobenzene	108	70-130
Hexachlorobutadiene	106	70-130
Butane	107	70-130
Isopentane	125	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	112	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCSD

Lab ID#: 1511056CR1-21AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3110604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 10:36 AM**	

Compound	%Recovery	Method Limits
Freon 12	124	70-130
Freon 114	112	70-130
Chloromethane	124	70-130
Vinyl Chloride	118	70-130
1,3-Butadiene	114	70-130
Bromomethane	103	70-130
Chloroethane	110	70-130
Freon 11	115	70-130
Ethanol	127	70-130
Freon 113	98	70-130
1,1-Dichloroethene	112	70-130
Acetone	112	70-130
2-Propanol	127	70-130
Carbon Disulfide	95	70-130
3-Chloropropene	106	70-130
Methylene Chloride	122	70-130
Methyl tert-butyl ether	108	70-130
trans-1,2-Dichloroethene	96	70-130
Hexane	113	70-130
1,1-Dichloroethane	118	70-130
2-Butanone (Methyl Ethyl Ketone)	117	70-130
cis-1,2-Dichloroethene	116	70-130
Tetrahydrofuran	130	70-130
Chloroform	116	70-130
1,1,1-Trichloroethane	115	70-130
Cyclohexane	111	70-130
Carbon Tetrachloride	112	70-130
2,2,4-Trimethylpentane	122	70-130
Benzene	103	70-130
1,2-Dichloroethane	109	70-130
Heptane	96	70-130
Trichloroethene	101	70-130
1,2-Dichloropropane	106	70-130
1,4-Dioxane	98	70-130
Bromodichloromethane	108	70-130
cis-1,3-Dichloropropene	96	70-130
4-Methyl-2-pentanone	98	70-130
Toluene	104	70-130
trans-1,3-Dichloropropene	116	70-130
1,1,2-Trichloroethane	108	70-130
Tetrachloroethene	104	70-130
2-Hexanone	106	70-130

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Client Sample ID: LCSD

Lab ID#: 1511056CR1-21AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3110604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 10:36 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	111	70-130
1,2-Dibromoethane (EDB)	112	70-130
Chlorobenzene	106	70-130
Ethyl Benzene	106	70-130
m,p-Xylene	106	70-130
o-Xylene	106	70-130
Styrene	103	70-130
Bromoform	108	70-130
Cumene	108	70-130
1,1,2,2-Tetrachloroethane	113	70-130
Propylbenzene	112	70-130
4-Ethyltoluene	107	70-130
1,3,5-Trimethylbenzene	101	70-130
1,2,4-Trimethylbenzene	105	70-130
1,3-Dichlorobenzene	108	70-130
1,4-Dichlorobenzene	105	70-130
alpha-Chlorotoluene	109	70-130
1,2-Dichlorobenzene	110	70-130
1,2,4-Trichlorobenzene	119	70-130
Hexachlorobutadiene	116	70-130
Butane	105	70-130
Isopentane	127	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	100	70-130

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2/19/2016

Ms. Elizabeth Kunkel
URS Corporation
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana Soil Vapor
Project #: 21563720.04204
Workorder #: 1511056D

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 11/4/2015 at Air Toxics Ltd.

The data and associated QC analyzed by Modified ASTM D-1946 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1511056D

Work Order Summary

CLIENT:	Ms. Elizabeth Kunkel AECOM 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin AECOM P.O. BOX 203970 Austin, TX 78720-1088
PHONE:	314-743-4179	**P.O. #**	87243.UB
FAX:		**PROJECT #**	21563720.04204 Roxana Soil Vapor
DATE RECEIVED:	11/04/2015	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	02/19/2016		
DATE REISSUED:	02/19/2016		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
04A	VMP-55-5-110215	Modified ASTM D-1946	8.5 "Hg	15 psi
19A	Lab Blank	Modified ASTM D-1946	NA	NA
19B	Lab Blank	Modified ASTM D-1946	NA	NA
20A	LCS	Modified ASTM D-1946	NA	NA
20AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Mayo DATE: 02/19/16

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified ASTM D-1946
URS Corporation
Workorder# 1511056D

One 1 Liter Summa Canister sample was received on November 04, 2015. The laboratory performed analysis via Modified ASTM Method D-1946 for Methane and fixed gases in air using GC/FID or GC/TCD. The method involves direct injection of 1.0 mL of sample.

On the analytical column employed for this analysis, Oxygen coelutes with Argon. The corresponding peak is quantitated as Oxygen.

Since Nitrogen is used to pressurize samples, the reported Nitrogen values are calculated by adding all the sample components and subtracting from 100%.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***ASTM D-1946***	***ATL Modifications***
Calibration	A single point calibration is performed using a reference standard closely matching the composition of the unknown.	A minimum of 5-point calibration curve is performed. Quantitation is based on average Response Factor.
Reference Standard	The composition of any reference standard must be known to within 0.01 mol % for any component.	The standards used by ATL are blended to a >/= 95% accuracy.
Sample Injection Volume	Components whose concentrations are in excess of 5 % should not be analyzed by using sample volumes greater than 0.5 mL.	The sample container is connected directly to a fixed volume sample loop of 1.0 mL on the GC. Linear range is defined by the calibration curve. Bags are loaded by vacuum.
Normalization	Normalize the mole percent values by multiplying each value by 100 and dividing by the sum of the original values. The sum of the original values should not differ from 100% by more than 1.0%.	Results are not normalized. The sum of the reported values can differ from 100% by as much as 15%, either due to analytical variability or an unusual sample matrix.
Precision	Precision requirements established at each concentration level.	Duplicates should agree within 25% RPD for detections > 5 X's the RL.

Receiving Notes

Analytical Notes

As per project specific client request the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit.

Per client request, sample VMP-55-5-110215 was removed from original workorder 1511056B and reported separately in this workorder.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: VMP-55-5-110215

Lab ID#: 1511056D-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	2.5
Nitrogen	0.28	80
Methane	0.00028	0.013
Carbon Dioxide	0.028	17

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Client Sample ID: VMP-55-5-110215

Lab ID#: 1511056D-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110609a**	**Date of Collection: 11/2/15 1:16:00 PM**	
Dil. Factor:	**2.82**	**Date of Analysis: 11/6/15 11:36 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	2.5
Nitrogen	0.28	80
Carbon Monoxide	0.028	Not Detected
Methane	0.00028	0.013
Carbon Dioxide	0.028	17
Ethane	0.0028	Not Detected
Ethene	0.0028	Not Detected
Helium	0.14	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: Lab Blank

Lab ID#: 1511056D-19A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110604a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 09:07 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	Not Detected
Nitrogen	0.10	Not Detected
Carbon Monoxide	0.010	Not Detected
Methane	0.00010	Not Detected
Carbon Dioxide	0.010	Not Detected
Ethane	0.0010	Not Detected
Ethene	0.0010	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: Lab Blank

Lab ID#: 1511056D-19B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110605c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 09:35 AM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Helium	0.050	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: LCS

Lab ID#: 1511056D-20A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 08:24 AM**	

Compound	%Recovery	Method Limits
Oxygen	100	85-115
Nitrogen	93	85-115
Carbon Monoxide	95	85-115
Methane	102	85-115
Carbon Dioxide	100	85-115
Ethane	101	85-115
Ethene	102	85-115
Helium	104	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 1511056D-20AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110627**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/15 09:26 PM**	

Compound	%Recovery	Method Limits
Oxygen	100	85-115
Nitrogen	93	85-115
Carbon Monoxide	94	85-115
Methane	103	85-115
Carbon Dioxide	100	85-115
Ethane	102	85-115
Ethene	103	85-115
Helium	101	85-115

Container Type: NA - Not Applicable

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2/19/2016
Ms. Elizabeth Kunkel
URS Corporation
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana Soil Vapor
Project #: 21563720.04204
Workorder #: 1511098C

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 11/5/2015 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1511098C

Work Order Summary

CLIENT:	Ms. Elizabeth Kunkel AECOM 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin AECOM P.O. BOX 203970 Austin, TX 78720-1088
PHONE:	314-743-4179	**P.O. #**	87243.UB
FAX:		**PROJECT #**	21563720.04204 Roxana Soil Vapor
DATE RECEIVED:	11/05/2015	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	02/19/2016		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
02A	VMP-55-20-110215	TO-15	4.5 "Hg	15.3 psi
06A	Lab Blank	TO-15	NA	NA
07A	CCV	TO-15	NA	NA
08A	LCS	TO-15	NA	NA
08AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 02/18/16

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 956
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LABORATORY NARRATIVE
EPA Method TO-15
URS Corporation
Workorder# 1511098C

One 1 Liter Summa Canister sample was received on November 05, 2015. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified may be false positives.

Dilution was performed on sample VMP-55-20-110215 due to the presence of high level target species.

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page.

Per client request, the workorder was reissued on 02/19/16 to report sample VMP-55-20-110215 individually. This sample was originally reported in workorder 1511098A.

Additionally, a narrative reported previously was removed as it is no longer applicable.

Per client request, sample VMP-55-20-110215 was removed from original workorder 1511098A and reported separately in this workorder.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS

Client Sample ID: VMP-55-20-110215

Lab ID#: 1511098C-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Hexane	400	240000	1400	850000
Cyclohexane	400	140000	1400	480000
2,2,4-Trimethylpentane	400	67000	1900	310000
Heptane	400	86000	1600	350000
Butane	1600	130000	3800	310000
Isopentane	1600	260000	4700	780000

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Client Sample ID: VMP-55-20-110215

Lab ID#: 1511098C-02A

EPA METHOD TO-15 GC/MS

File Name:	**14111115r1**	**Date of Collection: 11/2/15 1:16:00 PM**	
Dil. Factor:	**79.9**	**Date of Analysis: 11/11/15 03:22 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	400	Not Detected	2000	Not Detected
Freon 114	400	Not Detected	2800	Not Detected
Chloromethane	1600	Not Detected	3300	Not Detected
Vinyl Chloride	400	Not Detected	1000	Not Detected
1,3-Butadiene	400	Not Detected	880	Not Detected
Bromomethane	400	Not Detected	1600	Not Detected
Chloroethane	1600	Not Detected	4200	Not Detected
Freon 11	400	Not Detected	2200	Not Detected
Ethanol	1600	Not Detected	3000	Not Detected
Freon 113	400	Not Detected	3100	Not Detected
1,1-Dichloroethene	400	Not Detected	1600	Not Detected
Acetone	1600	Not Detected	3800	Not Detected
2-Propanol	1600	Not Detected	3900	Not Detected
Carbon Disulfide	400	Not Detected	1200	Not Detected
3-Chloropropene	1600	Not Detected	5000	Not Detected
Methylene Chloride	400	Not Detected	1400	Not Detected
Methyl tert-butyl ether	400	Not Detected UJ	1400	Not Detected UJ
trans-1,2-Dichloroethene	400	Not Detected	1600	Not Detected
Hexane	400	240000	1400	850000
1,1-Dichloroethane	400	Not Detected	1600	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1600	Not Detected	4700	Not Detected
cis-1,2-Dichloroethene	400	Not Detected	1600	Not Detected
Tetrahydrofuran	400	Not Detected	1200	Not Detected
Chloroform	400	Not Detected	2000	Not Detected
1,1,1-Trichloroethane	400	Not Detected	2200	Not Detected
Cyclohexane	400	140000	1400	480000
Carbon Tetrachloride	400	Not Detected	2500	Not Detected
2,2,4-Trimethylpentane	400	67000	1900	310000
Benzene	400	Not Detected	1300	Not Detected
1,2-Dichloroethane	400	Not Detected	1600	Not Detected
Heptane	400	86000	1600	350000
Trichloroethene	400	Not Detected	2100	Not Detected
1,2-Dichloropropane	400	Not Detected	1800	Not Detected
1,4-Dioxane	1600	Not Detected	5800	Not Detected
Bromodichloromethane	400	Not Detected	2700	Not Detected
cis-1,3-Dichloropropene	400	Not Detected	1800	Not Detected
4-Methyl-2-pentanone	400	Not Detected	1600	Not Detected
Toluene	400	Not Detected	1500	Not Detected
trans-1,3-Dichloropropene	400	Not Detected	1800	Not Detected
1,1,2-Trichloroethane	400	Not Detected	2200	Not Detected
Tetrachloroethene	400	Not Detected	2700	Not Detected
2-Hexanone	1600	Not Detected	6500	Not Detected

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Client Sample ID: VMP-55-20-110215

Lab ID#: 1511098C-02A

EPA METHOD TO-15 GC/MS

File Name:	**14111115r1**	**Date of Collection: 11/2/15 1:16:00 PM**	
Dil. Factor:	**79.9**	**Date of Analysis: 11/11/15 03:22 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	400	Not Detected	3400	Not Detected
1,2-Dibromoethane (EDB)	400	Not Detected	3100	Not Detected
Chlorobenzene	400	Not Detected	1800	Not Detected
Ethyl Benzene	400	Not Detected	1700	Not Detected
m,p-Xylene	400	Not Detected	1700	Not Detected
o-Xylene	400	Not Detected	1700	Not Detected
Styrene	400	Not Detected	1700	Not Detected
Bromoform	400	Not Detected	4100	Not Detected
Cumene	400	Not Detected	2000	Not Detected
1,1,2,2-Tetrachloroethane	400	Not Detected	2700	Not Detected
Propylbenzene	400	Not Detected	2000	Not Detected
4-Ethyltoluene	400	Not Detected	2000	Not Detected
1,3,5-Trimethylbenzene	400	Not Detected	2000	Not Detected
1,2,4-Trimethylbenzene	400	Not Detected	2000	Not Detected
1,3-Dichlorobenzene	400	Not Detected	2400	Not Detected
1,4-Dichlorobenzene	400	Not Detected	2400	Not Detected
alpha-Chlorotoluene	400	Not Detected	2100	Not Detected
1,2-Dichlorobenzene	400	Not Detected	2400	Not Detected
1,2,4-Trichlorobenzene	1600	Not Detected	12000	Not Detected
Hexachlorobutadiene	1600	Not Detected	17000	Not Detected
Butane	1600	130000	3800	310000
Isopentane	1600	260000	4700	780000

UJ = Analyte associated with low bias in the CCV and/or LCS.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1511098C-06A

EPA METHOD TO-15 GC/MS

File Name:	**14111105a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/15 09:46 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5.0	Not Detected	25	Not Detected
Freon 114	5.0	Not Detected	35	Not Detected
Chloromethane	20	Not Detected	41	Not Detected
Vinyl Chloride	5.0	Not Detected	13	Not Detected
1,3-Butadiene	5.0	Not Detected	11	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	20	Not Detected	53	Not Detected
Freon 11	5.0	Not Detected	28	Not Detected
Ethanol	20	Not Detected	38	Not Detected
Freon 113	5.0	Not Detected	38	Not Detected
1,1-Dichloroethene	5.0	Not Detected	20	Not Detected
Acetone	20	Not Detected	48	Not Detected
2-Propanol	20	Not Detected	49	Not Detected
Carbon Disulfide	5.0	Not Detected	16	Not Detected
3-Chloropropene	20	Not Detected	63	Not Detected
Methylene Chloride	5.0	1.8 J	17	6.1 J
Methyl tert-butyl ether	5.0	Not Detected UJ	18	Not Detected UJ
trans-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Hexane	5.0	Not Detected	18	Not Detected
1,1-Dichloroethane	5.0	Not Detected	20	Not Detected
2-Butanone (Methyl Ethyl Ketone)	20	Not Detected	59	Not Detected
cis-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Tetrahydrofuran	5.0	Not Detected	15	Not Detected
Chloroform	5.0	Not Detected	24	Not Detected
1,1,1-Trichloroethane	5.0	Not Detected	27	Not Detected
Cyclohexane	5.0	Not Detected	17	Not Detected
Carbon Tetrachloride	5.0	Not Detected	31	Not Detected
2,2,4-Trimethylpentane	5.0	Not Detected	23	Not Detected
Benzene	5.0	Not Detected	16	Not Detected
1,2-Dichloroethane	5.0	Not Detected	20	Not Detected
Heptane	5.0	Not Detected	20	Not Detected
Trichloroethene	5.0	Not Detected	27	Not Detected
1,2-Dichloropropane	5.0	Not Detected	23	Not Detected
1,4-Dioxane	20	Not Detected	72	Not Detected
Bromodichloromethane	5.0	Not Detected	34	Not Detected
cis-1,3-Dichloropropene	5.0	Not Detected	23	Not Detected
4-Methyl-2-pentanone	5.0	Not Detected	20	Not Detected
Toluene	5.0	Not Detected	19	Not Detected
trans-1,3-Dichloropropene	5.0	Not Detected	23	Not Detected
1,1,2-Trichloroethane	5.0	Not Detected	27	Not Detected
Tetrachloroethene	5.0	Not Detected	34	Not Detected
2-Hexanone	20	Not Detected	82	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 1511098C-06A

EPA METHOD TO-15 GC/MS

File Name:	**14111105a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/15 09:46 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	5.0	Not Detected	42	Not Detected
1,2-Dibromoethane (EDB)	5.0	Not Detected	38	Not Detected
Chlorobenzene	5.0	Not Detected	23	Not Detected
Ethyl Benzene	5.0	Not Detected	22	Not Detected
m,p-Xylene	5.0	Not Detected	22	Not Detected
o-Xylene	5.0	Not Detected	22	Not Detected
Styrene	5.0	Not Detected	21	Not Detected
Bromoform	5.0	Not Detected	52	Not Detected
Cumene	5.0	Not Detected	24	Not Detected
1,1,2,2-Tetrachloroethane	5.0	Not Detected	34	Not Detected
Propylbenzene	5.0	Not Detected	24	Not Detected
4-Ethyltoluene	5.0	Not Detected	24	Not Detected
1,3,5-Trimethylbenzene	5.0	Not Detected	24	Not Detected
1,2,4-Trimethylbenzene	5.0	Not Detected	24	Not Detected
1,3-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,4-Dichlorobenzene	5.0	Not Detected	30	Not Detected
alpha-Chlorotoluene	5.0	Not Detected	26	Not Detected
1,2-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,2,4-Trichlorobenzene	20	Not Detected	150	Not Detected
Hexachlorobutadiene	20	Not Detected	210	Not Detected
Butane	20	Not Detected	48	Not Detected
Isopentane	20	Not Detected	59	Not Detected

J = Estimated value.
UJ = Analyte associated with low bias in the CCV and/or LCS.
Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: CCV

Lab ID#: 1511098C-07A

EPA METHOD TO-15 GC/MS

File Name:	**14111102**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/15 08:28 AM**

Compound	%Recovery
Freon 12	91
Freon 114	90
Chloromethane	104
Vinyl Chloride	93
1,3-Butadiene	88
Bromomethane	76
Chloroethane	99
Freon 11	86
Ethanol	110
Freon 113	89
1,1-Dichloroethene	91
Acetone	98
2-Propanol	81
Carbon Disulfide	95
3-Chloropropene	86
Methylene Chloride	87
Methyl tert-butyl ether	64 Q
trans-1,2-Dichloroethene	94
Hexane	89
1,1-Dichloroethane	92
2-Butanone (Methyl Ethyl Ketone)	90
cis-1,2-Dichloroethene	90
Tetrahydrofuran	77
Chloroform	89
1,1,1-Trichloroethane	83
Cyclohexane	88
Carbon Tetrachloride	82
2,2,4-Trimethylpentane	91
Benzene	89
1,2-Dichloroethane	83
Heptane	86
Trichloroethene	84
1,2-Dichloropropane	94
1,4-Dioxane	92
Bromodichloromethane	87
cis-1,3-Dichloropropene	85
4-Methyl-2-pentanone	80
Toluene	88
trans-1,3-Dichloropropene	83
1,1,2-Trichloroethane	95
Tetrachloroethene	93
2-Hexanone	95

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Client Sample ID: CCV

Lab ID#: 1511098C-07A

EPA METHOD TO-15 GC/MS

File Name:	**14111102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/15 08:28 AM**	

Compound	%Recovery
Dibromochloromethane	91
1,2-Dibromoethane (EDB)	92
Chlorobenzene	95
Ethyl Benzene	90
m,p-Xylene	91
o-Xylene	90
Styrene	90
Bromoform	92
Cumene	90
1,1,2,2-Tetrachloroethane	109
Propylbenzene	92
4-Ethyltoluene	92
1,3,5-Trimethylbenzene	93
1,2,4-Trimethylbenzene	90
1,3-Dichlorobenzene	92
1,4-Dichlorobenzene	94
alpha-Chlorotoluene	90
1,2-Dichlorobenzene	95
1,2,4-Trichlorobenzene	76
Hexachlorobutadiene	82
Butane	98
Isopentane	89

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	93	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCS

Lab ID#: 1511098C-08A

EPA METHOD TO-15 GC/MS

File Name:	**14111103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/15 08:50 AM**	

Compound	%Recovery	Method Limits
Freon 12	104	70-130
Freon 114	106	70-130
Chloromethane	109	70-130
Vinyl Chloride	110	70-130
1,3-Butadiene	98	70-130
Bromomethane	86	70-130
Chloroethane	107	70-130
Freon 11	100	70-130
Ethanol	93	70-130
Freon 113	99	70-130
1,1-Dichloroethene	102	70-130
Acetone	110	70-130
2-Propanol	95	70-130
Carbon Disulfide	92	70-130
3-Chloropropene	87	70-130
Methylene Chloride	97	70-130
Methyl tert-butyl ether	62 Q	70-130
trans-1,2-Dichloroethene	91	70-130
Hexane	96	70-130
1,1-Dichloroethane	104	70-130
2-Butanone (Methyl Ethyl Ketone)	95	70-130
cis-1,2-Dichloroethene	108	70-130
Tetrahydrofuran	84	70-130
Chloroform	101	70-130
1,1,1-Trichloroethane	90	70-130
Cyclohexane	96	70-130
Carbon Tetrachloride	88	70-130
2,2,4-Trimethylpentane	101	70-130
Benzene	100	70-130
1,2-Dichloroethane	93	70-130
Heptane	92	70-130
Trichloroethene	98	70-130
1,2-Dichloropropane	103	70-130
1,4-Dioxane	110	70-130
Bromodichloromethane	92	70-130
cis-1,3-Dichloropropene	81	70-130
4-Methyl-2-pentanone	94	70-130
Toluene	95	70-130
trans-1,3-Dichloropropene	75	70-130
1,1,2-Trichloroethane	103	70-130
Tetrachloroethene	101	70-130
2-Hexanone	106	70-130

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Client Sample ID: LCS

Lab ID#: 1511098C-08A

EPA METHOD TO-15 GC/MS

File Name:	**14111103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/15 08:50 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	98	70-130
1,2-Dibromoethane (EDB)	98	70-130
Chlorobenzene	102	70-130
Ethyl Benzene	89	70-130
m,p-Xylene	95	70-130
o-Xylene	93	70-130
Styrene	97	70-130
Bromoform	99	70-130
Cumene	95	70-130
1,1,2,2-Tetrachloroethane	105	70-130
Propylbenzene	99	70-130
4-Ethyltoluene	96	70-130
1,3,5-Trimethylbenzene	96	70-130
1,2,4-Trimethylbenzene	93	70-130
1,3-Dichlorobenzene	98	70-130
1,4-Dichlorobenzene	97	70-130
alpha-Chlorotoluene	53 Q	70-130
1,2-Dichlorobenzene	97	70-130
1,2,4-Trichlorobenzene	62 Q	70-130
Hexachlorobutadiene	77	70-130
Butane	107	60-140
Isopentane	98	60-140

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCSD

Lab ID#: 1511098C-08AA

EPA METHOD TO-15 GC/MS

File Name:	**14111104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/15 09:12 AM**	

Compound	%Recovery	Method Limits
Freon 12	103	70-130
Freon 114	106	70-130
Chloromethane	106	70-130
Vinyl Chloride	107	70-130
1,3-Butadiene	97	70-130
Bromomethane	85	70-130
Chloroethane	109	70-130
Freon 11	100	70-130
Ethanol	94	70-130
Freon 113	100	70-130
1,1-Dichloroethene	101	70-130
Acetone	106	70-130
2-Propanol	95	70-130
Carbon Disulfide	91	70-130
3-Chloropropene	83	70-130
Methylene Chloride	100	70-130
Methyl tert-butyl ether	63 Q	70-130
trans-1,2-Dichloroethene	89	70-130
Hexane	96	70-130
1,1-Dichloroethane	105	70-130
2-Butanone (Methyl Ethyl Ketone)	98	70-130
cis-1,2-Dichloroethene	107	70-130
Tetrahydrofuran	82	70-130
Chloroform	100	70-130
1,1,1-Trichloroethane	91	70-130
Cyclohexane	93	70-130
Carbon Tetrachloride	89	70-130
2,2,4-Trimethylpentane	102	70-130
Benzene	100	70-130
1,2-Dichloroethane	94	70-130
Heptane	92	70-130
Trichloroethene	97	70-130
1,2-Dichloropropane	104	70-130
1,4-Dioxane	106	70-130
Bromodichloromethane	96	70-130
cis-1,3-Dichloropropene	83	70-130
4-Methyl-2-pentanone	96	70-130
Toluene	96	70-130
trans-1,3-Dichloropropene	74	70-130
1,1,2-Trichloroethane	102	70-130
Tetrachloroethene	98	70-130
2-Hexanone	108	70-130

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Client Sample ID: LCSD

Lab ID#: 1511098C-08AA

EPA METHOD TO-15 GC/MS

File Name:	**14111104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/15 09:12 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	92	70-130
1,2-Dibromoethane (EDB)	100	70-130
Chlorobenzene	100	70-130
Ethyl Benzene	91	70-130
m,p-Xylene	93	70-130
o-Xylene	94	70-130
Styrene	95	70-130
Bromoform	96	70-130
Cumene	93	70-130
1,1,2,2-Tetrachloroethane	107	70-130
Propylbenzene	99	70-130
4-Ethyltoluene	96	70-130
1,3,5-Trimethylbenzene	95	70-130
1,2,4-Trimethylbenzene	92	70-130
1,3-Dichlorobenzene	96	70-130
1,4-Dichlorobenzene	98	70-130
alpha-Chlorotoluene	55 Q	70-130
1,2-Dichlorobenzene	97	70-130
1,2,4-Trichlorobenzene	68 Q	70-130
Hexachlorobutadiene	70	70-130
Butane	113	60-140
Isopentane	100	60-140

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	101	70-130

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2/19/2016

Ms. Elizabeth Kunkel
URS Corporation
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana Soil Vapor
Project #: 21563720.04204
Workorder #: 1511098D

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 11/5/2015 at Air Toxics Ltd.

The data and associated QC analyzed by Modified ASTM D-1946 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1511098D

Work Order Summary

CLIENT:	Ms. Elizabeth Kunkel AECOM 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin AECOM P.O. BOX 203970 Austin, TX 78720-1088
PHONE:	314-743-4179	**P.O. #**	87243.UB
FAX:		**PROJECT #**	21563720.04204 Roxana Soil Vapor
DATE RECEIVED:	11/05/2015	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	02/19/2016		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
02A	VMP-55-20-110215	Modified ASTM D-1946	4.5 "Hg	15.3 psi
06A	Lab Blank	Modified ASTM D-1946	NA	NA
06B	Lab Blank	Modified ASTM D-1946	NA	NA
07A	LCS	Modified ASTM D-1946	NA	NA
07AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Mayo DATE: 02/19/16

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified ASTM D-1946
URS Corporation
Workorder# 1511098D

One 1 Liter Summa Canister sample was received on November 05, 2015. The laboratory performed analysis via Modified ASTM Method D-1946 for Methane and fixed gases in air using GC/FID or GC/TCD. The method involves direct injection of 1.0 mL of sample.

On the analytical column employed for this analysis, Oxygen coelutes with Argon. The corresponding peak is quantitated as Oxygen.

Since Nitrogen is used to pressurize samples, the reported Nitrogen values are calculated by adding all the sample components and subtracting from 100%.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***ASTM D-1946***	***ATL Modifications***
Calibration	A single point calibration is performed using a reference standard closely matching the composition of the unknown.	A minimum of 5-point calibration curve is performed. Quantitation is based on average Response Factor.
Reference Standard	The composition of any reference standard must be known to within 0.01 mol % for any component.	The standards used by ATL are blended to a >/= 95% accuracy.
Sample Injection Volume	Components whose concentrations are in excess of 5 % should not be analyzed by using sample volumes greater than 0.5 mL.	The sample container is connected directly to a fixed volume sample loop of 1.0 mL on the GC. Linear range is defined by the calibration curve. Bags are loaded by vacuum.
Normalization	Normalize the mole percent values by multiplying each value by 100 and dividing by the sum of the original values. The sum of the original values should not differ from 100% by more than 1.0%.	Results are not normalized. The sum of the reported values can differ from 100% by as much as 15%, either due to analytical variability or an unusual sample matrix.
Precision	Precision requirements established at each concentration level.	Duplicates should agree within 25% RPD for detections > 5 X's the RL.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per project specific client request the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit.

Per client request, sample VMP-55-20-110215 was removed from original workorder 1511098B and reported separately in this workorder.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: VMP-55-20-110215

Lab ID#: 1511098D-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	1.7
Nitrogen	0.24	78
Methane	0.00024	2.1
Carbon Dioxide	0.024	18
Ethane	0.0024	0.00077 J

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Client Sample ID: VMP-55-20-110215

Lab ID#: 1511098D-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111114a**	**Date of Collection: 11/2/15 1:16:00 PM**	
Dil. Factor:	**2.40**	**Date of Analysis: 11/11/15 12:15 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	1.7
Nitrogen	0.24	78
Carbon Monoxide	0.024	Not Detected
Methane	0.00024	2.1
Carbon Dioxide	0.024	18
Ethane	0.0024	0.00077 J
Ethene	0.0024	Not Detected
Helium	0.12	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: Lab Blank

Lab ID#: 1511098D-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/10/15 10:06 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	Not Detected
Nitrogen	0.10	Not Detected
Carbon Monoxide	0.010	Not Detected
Methane	0.00010	Not Detected
Carbon Dioxide	0.010	Not Detected
Ethane	0.0010	Not Detected
Ethene	0.0010	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: Lab Blank

Lab ID#: 1511098D-06B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111105c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/10/15 10:28 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Helium	0.050	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: LCS

Lab ID#: 1511098D-07A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/10/15 09:08 PM**	

Compound	%Recovery	Method Limits
Oxygen	100	85-115
Nitrogen	93	85-115
Carbon Monoxide	96	85-115
Methane	108	85-115
Carbon Dioxide	100	85-115
Ethane	107	85-115
Ethene	108	85-115
Helium	103	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 1511098D-07AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111125**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/15 06:56 PM**	

Compound	%Recovery	Method Limits
Oxygen	100	85-115
Nitrogen	93	85-115
Carbon Monoxide	95	85-115
Methane	109	85-115
Carbon Dioxide	100	85-115
Ethane	108	85-115
Ethene	109	85-115
Helium	104	85-115

Container Type: NA - Not Applicable

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2/19/2016
Ms. Elizabeth Kunkel
URS Corporation
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana Soil Vapor
Project #: 21563720.04204
Workorder #: 1511101AR1

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 11/6/2015 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1511101AR1

Work Order Summary

CLIENT:	Ms. Elizabeth Kunkel AECOM 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin AECOM P.O. BOX 203970 Austin, TX 78720-1088
PHONE:	314-743-4179	**P.O. #**	87243.UB
FAX:		**PROJECT #**	21563720.04204 Roxana Soil Vapor
DATE RECEIVED:	11/06/2015	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/19/2015		
DATE REISSUED:	02/19/2016		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-110415	TO-15	8 "Hg	14.7 psi
02A	VMP-15-21.5-110415	TO-15	8.4 "Hg	14.8 psi
03A	VMP-15-25.5-110415	TO-15	5.3 "Hg	14.9 psi
04A	VMP-15-29-110415	TO-15	6.9 "Hg	14.5 psi
06A	Lab Blank	TO-15	NA	NA
07A	CCV	TO-15	NA	NA
08A	LCS	TO-15	NA	NA
08AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 02/18/16

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 956
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LABORATORY NARRATIVE
EPA Method TO-15
URS Corporation
Workorder# 1511101AR1

Four 1 Liter Summa Canister samples were received on November 06, 2015. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified (0.2 ppbv for compounds reported at 0.5 ppbv and 0.8 ppbv for compounds reported at 2.0 ppbv) may be false positives.

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

Per client request, the workorder was reissued on 02/19/16 to remove sample VMP-25-5-110515 from the final report. Sample VMP-25-5-110515 was reported individually in workorder 1511101C.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VMP-15-5-110415

Lab ID#: 1511101AR1-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	0.53 J	6.8	2.6 J
Acetone	14	8.1 J	32	19 J
2-Propanol	5.5	4.5 J	13	11 J
Carbon Disulfide	5.5	0.47 J	17	1.5 J
2-Butanone (Methyl Ethyl Ketone)	5.5	2.5 J	16	7.3 J
Chloroform	1.4	0.77 J	6.7	3.8 J
Benzene	1.4	0.26 J	4.4	0.83 J
Toluene	1.4	0.59 J	5.1	2.2 J
Isopentane	5.5	2.0 J	16	5.9 J

Client Sample ID: VMP-15-21.5-110415

Lab ID#: 1511101AR1-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	0.44 J	6.9	2.2 J
Acetone	14	8.4 J	33	20 J
2-Propanol	5.6	3.1 J	14	7.7 J
Carbon Disulfide	5.6	0.63 J	17	2.0 J
Methylene Chloride	14	1.2 J	48	4.0 J
Hexane	1.4	0.79 J	4.9	2.8 J
2-Butanone (Methyl Ethyl Ketone)	5.6	1.4 J	16	4.2 J
Chloroform	1.4	2.4	6.8	11
Cyclohexane	1.4	0.36 J	4.8	1.2 J
2,2,4-Trimethylpentane	1.4	0.31 J	6.5	1.5 J
Benzene	1.4	0.17 J	4.4	0.54 J
Heptane	1.4	0.31 J	5.7	1.3 J
Toluene	1.4	0.58 J	5.2	2.2 J
Isopentane	5.6	3.5 J	16	10 J

Client Sample ID: VMP-15-25.5-110415

Lab ID#: 1511101AR1-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VMP-15-25.5-110415

Lab ID#: 1511101AR1-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.52 J	6.0	2.5 J
Acetone	12	6.3 J	29	15 J
2-Propanol	4.9	1.2 J	12	2.9 J
Carbon Disulfide	4.9	0.57 J	15	1.8 J
Methylene Chloride	12	0.81 J	42	2.8 J
2-Butanone (Methyl Ethyl Ketone)	4.9	1.0 J	14	3.0 J
Benzene	1.2	0.48 J	3.9	1.5 J
Butane	4.9	4.2 J	12	9.9 J
Isopentane	4.9	2.3 J	14	6.9 J

Client Sample ID: VMP-15-29-110415

Lab ID#: 1511101AR1-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	0.46 J	6.4	2.3 J
Ethanol	5.2	11	9.7	21
Acetone	13	12 J	31	29 J
2-Propanol	5.2	3.1 J	13	7.5 J
Carbon Disulfide	5.2	0.65 J	16	2.0 J
Methylene Chloride	13	0.85 J	45	3.0 J
Methyl tert-butyl ether	1.3	0.33 J	4.6	1.2 J
2-Butanone (Methyl Ethyl Ketone)	5.2	2.3 J	15	6.8 J
2,2,4-Trimethylpentane	1.3	1.2 J	6.0	5.7 J
Benzene	1.3	1.4	4.1	4.5
Toluene	1.3	0.66 J	4.9	2.5 J
Butane	5.2	7.5	12	18
Isopentane	5.2	6.9	15	20

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Client Sample ID: VMP-15-5-110415

Lab ID#: 1511101AR1-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110921**	**Date of Collection: 11/4/15 2:19:00 PM**	
Dil. Factor:	**2.73**	**Date of Analysis: 11/9/15 11:15 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	0.53 J	6.8	2.6 J
Freon 114	1.4	Not Detected	9.5	Not Detected
Chloromethane	14	Not Detected	28	Not Detected
Vinyl Chloride	1.4	Not Detected	3.5	Not Detected
1,3-Butadiene	1.4	Not Detected	3.0	Not Detected
Bromomethane	14	Not Detected	53	Not Detected
Chloroethane	5.5	Not Detected	14	Not Detected
Freon 11	1.4	Not Detected	7.7	Not Detected
Ethanol	5.5	Not Detected	10	Not Detected
Freon 113	1.4	Not Detected	10	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.4	Not Detected
Acetone	14	8.1 J	32	19 J
2-Propanol	5.5	4.5 J	13	11 J
Carbon Disulfide	5.5	0.47 J	17	1.5 J
3-Chloropropene	5.5	Not Detected	17	Not Detected
Methylene Chloride	14	Not Detected	47	Not Detected
Methyl tert-butyl ether	1.4	Not Detected	4.9	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.4	Not Detected
Hexane	1.4	Not Detected	4.8	Not Detected
1,1-Dichloroethane	1.4	Not Detected	5.5	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.5	2.5 J	16	7.3 J
cis-1,2-Dichloroethene	1.4	Not Detected	5.4	Not Detected
Tetrahydrofuran	1.4	Not Detected	4.0	Not Detected
Chloroform	1.4	0.77 J	6.7	3.8 J
1,1,1-Trichloroethane	1.4	Not Detected	7.4	Not Detected
Cyclohexane	1.4	Not Detected	4.7	Not Detected
Carbon Tetrachloride	1.4	Not Detected	8.6	Not Detected
2,2,4-Trimethylpentane	1.4	Not Detected	6.4	Not Detected
Benzene	1.4	0.26 J	4.4	0.83 J
1,2-Dichloroethane	1.4	Not Detected	5.5	Not Detected
Heptane	1.4	Not Detected	5.6	Not Detected
Trichloroethene	1.4	Not Detected	7.3	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.3	Not Detected
1,4-Dioxane	5.5	Not Detected	20	Not Detected
Bromodichloromethane	1.4	Not Detected	9.1	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.2	Not Detected
4-Methyl-2-pentanone	1.4	Not Detected	5.6	Not Detected
Toluene	1.4	0.59 J	5.1	2.2 J
trans-1,3-Dichloropropene	1.4	Not Detected	6.2	Not Detected
1,1,2-Trichloroethane	1.4	Not Detected	7.4	Not Detected
Tetrachloroethene	1.4	Not Detected	9.2	Not Detected
2-Hexanone	5.5	Not Detected	22	Not Detected

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Client Sample ID: VMP-15-5-110415

Lab ID#: 1511101AR1-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110921**	**Date of Collection: 11/4/15 2:19:00 PM**	
Dil. Factor:	**2.73**	**Date of Analysis: 11/9/15 11:15 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	10	Not Detected
Chlorobenzene	1.4	Not Detected	6.3	Not Detected
Ethyl Benzene	1.4	Not Detected	5.9	Not Detected
m,p-Xylene	1.4	Not Detected	5.9	Not Detected
o-Xylene	1.4	Not Detected	5.9	Not Detected
Styrene	1.4	Not Detected	5.8	Not Detected
Bromoform	1.4	Not Detected	14	Not Detected
Cumene	1.4	Not Detected	6.7	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.4	Not Detected
Propylbenzene	1.4	Not Detected	6.7	Not Detected
4-Ethyltoluene	1.4	Not Detected	6.7	Not Detected
1,3,5-Trimethylbenzene	1.4	Not Detected	6.7	Not Detected
1,2,4-Trimethylbenzene	1.4	Not Detected	6.7	Not Detected
1,3-Dichlorobenzene	1.4	Not Detected	8.2	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.2	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.1	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.2	Not Detected
1,2,4-Trichlorobenzene	5.5	Not Detected	40	Not Detected
Hexachlorobutadiene	5.5	Not Detected	58	Not Detected
Butane	5.5	Not Detected	13	Not Detected
Isopentane	5.5	2.0 J	16	5.9 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: VMP-15-21.5-110415

Lab ID#: 1511101AR1-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110922**	**Date of Collection: 11/4/15 2:35:00 PM**	
Dil. Factor:	**2.79**	**Date of Analysis: 11/9/15 11:55 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	0.44 J	6.9	2.2 J
Freon 114	1.4	Not Detected	9.8	Not Detected
Chloromethane	14	Not Detected	29	Not Detected
Vinyl Chloride	1.4	Not Detected	3.6	Not Detected
1,3-Butadiene	1.4	Not Detected	3.1	Not Detected
Bromomethane	14	Not Detected	54	Not Detected
Chloroethane	5.6	Not Detected	15	Not Detected
Freon 11	1.4	Not Detected	7.8	Not Detected
Ethanol	5.6	Not Detected	10	Not Detected
Freon 113	1.4	Not Detected	11	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Acetone	14	8.4 J	33	20 J
2-Propanol	5.6	3.1 J	14	7.7 J
Carbon Disulfide	5.6	0.63 J	17	2.0 J
3-Chloropropene	5.6	Not Detected	17	Not Detected
Methylene Chloride	14	1.2 J	48	4.0 J
Methyl tert-butyl ether	1.4	Not Detected	5.0	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Hexane	1.4	0.79 J	4.9	2.8 J
1,1-Dichloroethane	1.4	Not Detected	5.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.6	1.4 J	16	4.2 J
cis-1,2-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Tetrahydrofuran	1.4	Not Detected	4.1	Not Detected
Chloroform	1.4	2.4	6.8	11
1,1,1-Trichloroethane	1.4	Not Detected	7.6	Not Detected
Cyclohexane	1.4	0.36 J	4.8	1.2 J
Carbon Tetrachloride	1.4	Not Detected	8.8	Not Detected
2,2,4-Trimethylpentane	1.4	0.31 J	6.5	1.5 J
Benzene	1.4	0.17 J	4.4	0.54 J
1,2-Dichloroethane	1.4	Not Detected	5.6	Not Detected
Heptane	1.4	0.31 J	5.7	1.3 J
Trichloroethene	1.4	Not Detected	7.5	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.4	Not Detected
1,4-Dioxane	5.6	Not Detected	20	Not Detected
Bromodichloromethane	1.4	Not Detected	9.3	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.3	Not Detected
4-Methyl-2-pentanone	1.4	Not Detected	5.7	Not Detected
Toluene	1.4	0.58 J	5.2	2.2 J
trans-1,3-Dichloropropene	1.4	Not Detected	6.3	Not Detected
1,1,2-Trichloroethane	1.4	Not Detected	7.6	Not Detected
Tetrachloroethene	1.4	Not Detected	9.5	Not Detected
2-Hexanone	5.6	Not Detected	23	Not Detected

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Client Sample ID: VMP-15-21.5-110415

Lab ID#: 1511101AR1-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110922**	**Date of Collection: 11/4/15 2:35:00 PM**	
Dil. Factor:	**2.79**	**Date of Analysis: 11/9/15 11:55 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.4	Not Detected
Ethyl Benzene	1.4	Not Detected	6.0	Not Detected
m,p-Xylene	1.4	Not Detected	6.0	Not Detected
o-Xylene	1.4	Not Detected	6.0	Not Detected
Styrene	1.4	Not Detected	5.9	Not Detected
Bromoform	1.4	Not Detected	14	Not Detected
Cumene	1.4	Not Detected	6.8	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.6	Not Detected
Propylbenzene	1.4	Not Detected	6.8	Not Detected
4-Ethyltoluene	1.4	Not Detected	6.8	Not Detected
1,3,5-Trimethylbenzene	1.4	Not Detected	6.8	Not Detected
1,2,4-Trimethylbenzene	1.4	Not Detected	6.8	Not Detected
1,3-Dichlorobenzene	1.4	Not Detected	8.4	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.4	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.2	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.4	Not Detected
1,2,4-Trichlorobenzene	5.6	Not Detected	41	Not Detected
Hexachlorobutadiene	5.6	Not Detected	60	Not Detected
Butane	5.6	Not Detected	13	Not Detected
Isopentane	5.6	3.5 J	16	10 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	88	70-130

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Client Sample ID: VMP-15-25.5-110415

Lab ID#: 1511101AR1-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110923**	**Date of Collection: 11/4/15 2:56:00 PM**	
Dil. Factor:	**2.44**	**Date of Analysis: 11/10/15 12:22 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.52 J	6.0	2.5 J
Freon 114	1.2	Not Detected	8.5	Not Detected
Chloromethane	12	Not Detected	25	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,3-Butadiene	1.2	Not Detected	2.7	Not Detected
Bromomethane	12	Not Detected	47	Not Detected
Chloroethane	4.9	Not Detected	13	Not Detected
Freon 11	1.2	Not Detected	6.8	Not Detected
Ethanol	4.9	Not Detected	9.2	Not Detected
Freon 113	1.2	Not Detected	9.4	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	6.3 J	29	15 J
2-Propanol	4.9	1.2 J	12	2.9 J
Carbon Disulfide	4.9	0.57 J	15	1.8 J
3-Chloropropene	4.9	Not Detected	15	Not Detected
Methylene Chloride	12	0.81 J	42	2.8 J
Methyl tert-butyl ether	1.2	Not Detected	4.4	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Hexane	1.2	Not Detected	4.3	Not Detected
1,1-Dichloroethane	1.2	Not Detected	4.9	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.9	1.0 J	14	3.0 J
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.6	Not Detected
Chloroform	1.2	Not Detected	6.0	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Cyclohexane	1.2	Not Detected	4.2	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.7	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.7	Not Detected
Benzene	1.2	0.48 J	3.9	1.5 J
1,2-Dichloroethane	1.2	Not Detected	4.9	Not Detected
Heptane	1.2	Not Detected	5.0	Not Detected
Trichloroethene	1.2	Not Detected	6.6	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.6	Not Detected
1,4-Dioxane	4.9	Not Detected	18	Not Detected
Bromodichloromethane	1.2	Not Detected	8.2	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.5	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	5.0	Not Detected
Toluene	1.2	Not Detected	4.6	Not Detected
trans-1,3-Dichloropropene	1.2	Not Detected	5.5	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Tetrachloroethene	1.2	Not Detected	8.3	Not Detected
2-Hexanone	4.9	Not Detected	20	Not Detected

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Client Sample ID: VMP-15-25.5-110415

Lab ID#: 1511101AR1-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110923**	**Date of Collection: 11/4/15 2:56:00 PM**	
Dil. Factor:	**2.44**	**Date of Analysis: 11/10/15 12:22 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	10	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.4	Not Detected
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	Not Detected	5.3	Not Detected
m,p-Xylene	1.2	Not Detected	5.3	Not Detected
o-Xylene	1.2	Not Detected	5.3	Not Detected
Styrene	1.2	Not Detected	5.2	Not Detected
Bromoform	1.2	Not Detected	13	Not Detected
Cumene	1.2	Not Detected	6.0	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.4	Not Detected
Propylbenzene	1.2	Not Detected	6.0	Not Detected
4-Ethyltoluene	1.2	Not Detected	6.0	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	6.0	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	6.0	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.3	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,2,4-Trichlorobenzene	4.9	Not Detected	36	Not Detected
Hexachlorobutadiene	4.9	Not Detected	52	Not Detected
Butane	4.9	4.2 J	12	9.9 J
Isopentane	4.9	2.3 J	14	6.9 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: VMP-15-29-110415

Lab ID#: 1511101AR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110924**	**Date of Collection: 11/4/15 3:14:00 PM**	
Dil. Factor:	**2.58**	**Date of Analysis: 11/10/15 01:02 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	0.46 J	6.4	2.3 J
Freon 114	1.3	Not Detected	9.0	Not Detected
Chloromethane	13	Not Detected	27	Not Detected
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,3-Butadiene	1.3	Not Detected	2.8	Not Detected
Bromomethane	13	Not Detected	50	Not Detected
Chloroethane	5.2	Not Detected	14	Not Detected
Freon 11	1.3	Not Detected	7.2	Not Detected
Ethanol	5.2	11	9.7	21
Freon 113	1.3	Not Detected	9.9	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Acetone	13	12 J	31	29 J
2-Propanol	5.2	3.1 J	13	7.5 J
Carbon Disulfide	5.2	0.65 J	16	2.0 J
3-Chloropropene	5.2	Not Detected	16	Not Detected
Methylene Chloride	13	0.85 J	45	3.0 J
Methyl tert-butyl ether	1.3	0.33 J	4.6	1.2 J
trans-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Hexane	1.3	Not Detected	4.5	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.2	2.3 J	15	6.8 J
cis-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.8	Not Detected
Chloroform	1.3	Not Detected	6.3	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Cyclohexane	1.3	Not Detected	4.4	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.1	Not Detected
2,2,4-Trimethylpentane	1.3	1.2 J	6.0	5.7 J
Benzene	1.3	1.4	4.1	4.5
1,2-Dichloroethane	1.3	Not Detected	5.2	Not Detected
Heptane	1.3	Not Detected	5.3	Not Detected
Trichloroethene	1.3	Not Detected	6.9	Not Detected
1,2-Dichloropropane	1.3	Not Detected	6.0	Not Detected
1,4-Dioxane	5.2	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.6	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
4-Methyl-2-pentanone	1.3	Not Detected	5.3	Not Detected
Toluene	1.3	0.66 J	4.9	2.5 J
trans-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
1,1,2-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Tetrachloroethene	1.3	Not Detected	8.8	Not Detected
2-Hexanone	5.2	Not Detected	21	Not Detected

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Client Sample ID: VMP-15-29-110415

Lab ID#: 1511101AR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110924**	**Date of Collection: 11/4/15 3:14:00 PM**	
Dil. Factor:	**2.58**	**Date of Analysis: 11/10/15 01:02 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.9	Not Detected
Chlorobenzene	1.3	Not Detected	5.9	Not Detected
Ethyl Benzene	1.3	Not Detected	5.6	Not Detected
m,p-Xylene	1.3	Not Detected	5.6	Not Detected
o-Xylene	1.3	Not Detected	5.6	Not Detected
Styrene	1.3	Not Detected	5.5	Not Detected
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	Not Detected	6.3	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.8	Not Detected
Propylbenzene	1.3	Not Detected	6.3	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.3	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.3	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.3	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.7	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,2,4-Trichlorobenzene	5.2	Not Detected	38	Not Detected
Hexachlorobutadiene	5.2	Not Detected	55	Not Detected
Butane	5.2	7.5	12	18
Isopentane	5.2	6.9	15	20

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	87	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1511101AR1-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110907e**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/15 01:59 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	0.94 J	12	2.2 J
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	0.14 J	6.2	0.42 J
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	0.051 J	1.6	0.16 J
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 1511101AR1-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110907e**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/15 01:59 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	0.058 J	3.0	0.35 J
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected
Butane	2.0	Not Detected	4.8	Not Detected
Isopentane	2.0	Not Detected	5.9	Not Detected

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: CCV

Lab ID#: 1511101AR1-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110902**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/15 11:05 AM**

Compound	%Recovery
Freon 12	119
Freon 114	116
Chloromethane	115
Vinyl Chloride	117
1,3-Butadiene	111
Bromomethane	109
Chloroethane	108
Freon 11	111
Ethanol	105
Freon 113	112
1,1-Dichloroethene	114
Acetone	118
2-Propanol	120
Carbon Disulfide	112
3-Chloropropene	114
Methylene Chloride	123
Methyl tert-butyl ether	115
trans-1,2-Dichloroethene	115
Hexane	119
1,1-Dichloroethane	119
2-Butanone (Methyl Ethyl Ketone)	124
cis-1,2-Dichloroethene	120
Tetrahydrofuran	124
Chloroform	120
1,1,1-Trichloroethane	118
Cyclohexane	113
Carbon Tetrachloride	113
2,2,4-Trimethylpentane	127
Benzene	120
1,2-Dichloroethane	122
Heptane	120
Trichloroethene	115
1,2-Dichloropropane	116
1,4-Dioxane	121
Bromodichloromethane	118
cis-1,3-Dichloropropene	126
4-Methyl-2-pentanone	116
Toluene	119
trans-1,3-Dichloropropene	128
1,1,2-Trichloroethane	124
Tetrachloroethene	118
2-Hexanone	123

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Client Sample ID: CCV

Lab ID#: 1511101AR1-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110902**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/15 11:05 AM**	

Compound	%Recovery
Dibromochloromethane	121
1,2-Dibromoethane (EDB)	118
Chlorobenzene	116
Ethyl Benzene	123
m,p-Xylene	124
o-Xylene	125
Styrene	128
Bromoform	118
Cumene	123
1,1,2,2-Tetrachloroethane	128
Propylbenzene	121
4-Ethyltoluene	127
1,3,5-Trimethylbenzene	122
1,2,4-Trimethylbenzene	131 Q
1,3-Dichlorobenzene	123
1,4-Dichlorobenzene	127
alpha-Chlorotoluene	137 Q
1,2-Dichlorobenzene	130
1,2,4-Trichlorobenzene	123
Hexachlorobutadiene	125
Butane	116
Isopentane	114

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: LCS

Lab ID#: 1511101AR1-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110903**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/15 11:43 AM**	

Compound	%Recovery	Method Limits
Freon 12	123	70-130
Freon 114	121	70-130
Chloromethane	119	70-130
Vinyl Chloride	123	70-130
1,3-Butadiene	113	70-130
Bromomethane	109	70-130
Chloroethane	110	70-130
Freon 11	116	70-130
Ethanol	114	70-130
Freon 113	113	70-130
1,1-Dichloroethene	115	70-130
Acetone	112	70-130
2-Propanol	128	70-130
Carbon Disulfide	99	70-130
3-Chloropropene	107	70-130
Methylene Chloride	123	70-130
Methyl tert-butyl ether	114	70-130
trans-1,2-Dichloroethene	97	70-130
Hexane	120	70-130
1,1-Dichloroethane	121	70-130
2-Butanone (Methyl Ethyl Ketone)	124	70-130
cis-1,2-Dichloroethene	135 Q	70-130
Tetrahydrofuran	121	70-130
Chloroform	120	70-130
1,1,1-Trichloroethane	113	70-130
Cyclohexane	111	70-130
Carbon Tetrachloride	109	70-130
2,2,4-Trimethylpentane	125	70-130
Benzene	122	70-130
1,2-Dichloroethane	124	70-130
Heptane	119	70-130
Trichloroethene	123	70-130
1,2-Dichloropropane	116	70-130
1,4-Dioxane	125	70-130
Bromodichloromethane	124	70-130
cis-1,3-Dichloropropene	122	70-130
4-Methyl-2-pentanone	122	70-130
Toluene	120	70-130
trans-1,3-Dichloropropene	118	70-130
1,1,2-Trichloroethane	112	70-130
Tetrachloroethene	111	70-130
2-Hexanone	124	70-130

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Client Sample ID: LCS

Lab ID#: 1511101AR1-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110903**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/15 11:43 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	116	70-130
1,2-Dibromoethane (EDB)	116	70-130
Chlorobenzene	115	70-130
Ethyl Benzene	118	70-130
m,p-Xylene	120	70-130
o-Xylene	125	70-130
Styrene	132 Q	70-130
Bromoform	109	70-130
Cumene	110	70-130
1,1,2,2-Tetrachloroethane	109	70-130
Propylbenzene	113	70-130
4-Ethyltoluene	113	70-130
1,3,5-Trimethylbenzene	116	70-130
1,2,4-Trimethylbenzene	122	70-130
1,3-Dichlorobenzene	107	70-130
1,4-Dichlorobenzene	114	70-130
alpha-Chlorotoluene	111	70-130
1,2-Dichlorobenzene	105	70-130
1,2,4-Trichlorobenzene	120	70-130
Hexachlorobutadiene	118	70-130
Butane	122	70-130
Isopentane	115	70-130

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	87	70-130

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Client Sample ID: LCSD

Lab ID#: 1511101AR1-08AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110904**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/15 12:09 PM**	

Compound	%Recovery	Method Limits
Freon 12	115	70-130
Freon 114	118	70-130
Chloromethane	113	70-130
Vinyl Chloride	114	70-130
1,3-Butadiene	105	70-130
Bromomethane	104	70-130
Chloroethane	111	70-130
Freon 11	110	70-130
Ethanol	109	70-130
Freon 113	106	70-130
1,1-Dichloroethene	109	70-130
Acetone	107	70-130
2-Propanol	121	70-130
Carbon Disulfide	94	70-130
3-Chloropropene	104	70-130
Methylene Chloride	116	70-130
Methyl tert-butyl ether	106	70-130
trans-1,2-Dichloroethene	94	70-130
Hexane	111	70-130
1,1-Dichloroethane	114	70-130
2-Butanone (Methyl Ethyl Ketone)	118	70-130
cis-1,2-Dichloroethene	129	70-130
Tetrahydrofuran	117	70-130
Chloroform	115	70-130
1,1,1-Trichloroethane	110	70-130
Cyclohexane	108	70-130
Carbon Tetrachloride	108	70-130
2,2,4-Trimethylpentane	120	70-130
Benzene	118	70-130
1,2-Dichloroethane	120	70-130
Heptane	118	70-130
Trichloroethene	123	70-130
1,2-Dichloropropane	113	70-130
1,4-Dioxane	120	70-130
Bromodichloromethane	120	70-130
cis-1,3-Dichloropropene	117	70-130
4-Methyl-2-pentanone	119	70-130
Toluene	117	70-130
trans-1,3-Dichloropropene	115	70-130
1,1,2-Trichloroethane	111	70-130
Tetrachloroethene	109	70-130
2-Hexanone	123	70-130

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Client Sample ID: LCSD

Lab ID#: 1511101AR1-08AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110904**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/15 12:09 PM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	115	70-130
1,2-Dibromoethane (EDB)	117	70-130
Chlorobenzene	113	70-130
Ethyl Benzene	116	70-130
m,p-Xylene	116	70-130
o-Xylene	122	70-130
Styrene	129	70-130
Bromoform	115	70-130
Cumene	119	70-130
1,1,2,2-Tetrachloroethane	115	70-130
Propylbenzene	121	70-130
4-Ethyltoluene	124	70-130
1,3,5-Trimethylbenzene	111	70-130
1,2,4-Trimethylbenzene	121	70-130
1,3-Dichlorobenzene	105	70-130
1,4-Dichlorobenzene	108	70-130
alpha-Chlorotoluene	116	70-130
1,2-Dichlorobenzene	101	70-130
1,2,4-Trichlorobenzene	123	70-130
Hexachlorobutadiene	117	70-130
Butane	119	70-130
Isopentane	110	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	97	70-130

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2/19/2016

Ms. Elizabeth Kunkel
URS Corporation
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana Soil Vapor
Project #: 21563720.04204
Workorder #: 1511101BR1

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 11/6/2015 at Air Toxics Ltd.

The data and associated QC analyzed by Modified ASTM D-1946 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1511101BR1

Work Order Summary

CLIENT:	Ms. Elizabeth Kunkel AECOM 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin AECOM P.O. BOX 203970 Austin, TX 78720-1088
PHONE:	314-743-4179	**P.O. #**	87243.UB
FAX:		**PROJECT #**	21563720.04204 Roxana Soil Vapor
DATE RECEIVED:	11/06/2015	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/19/2015		
DATE REISSUED:	02/19/2016		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-110415	Modified ASTM D-1946	8 "Hg	14.7 psi
02A	VMP-15-21.5-110415	Modified ASTM D-1946	8.4 "Hg	14.8 psi
03A	VMP-15-25.5-110415	Modified ASTM D-1946	5.3 "Hg	14.9 psi
04A	VMP-15-29-110415	Modified ASTM D-1946	6.9 "Hg	14.5 psi
06A	Lab Blank	Modified ASTM D-1946	NA	NA
06B	Lab Blank	Modified ASTM D-1946	NA	NA
07A	LCS	Modified ASTM D-1946	NA	NA
07AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Mayo DATE: 02/19/16

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified ASTM D-1946
URS Corporation
Workorder# 1511101BR1

Four 1 Liter Summa Canister samples were received on November 06, 2015. The laboratory performed analysis via Modified ASTM Method D-1946 for Methane and fixed gases in air using GC/FID or GC/TCD. The method involves direct injection of 1.0 mL of sample.

On the analytical column employed for this analysis, Oxygen coelutes with Argon. The corresponding peak is quantitated as Oxygen.

Since Nitrogen is used to pressurize samples, the reported Nitrogen values are calculated by adding all the sample components and subtracting from 100%.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***ASTM D-1946***	***ATL Modifications***
Calibration	A single point calibration is performed using a reference standard closely matching the composition of the unknown.	A minimum of 5-point calibration curve is performed. Quantitation is based on average Response Factor.
Reference Standard	The composition of any reference standard must be known to within 0.01 mol % for any component.	The standards used by ATL are blended to a >/= 95% accuracy.
Sample Injection Volume	Components whose concentrations are in excess of 5 % should not be analyzed by using sample volumes greater than 0.5 mL.	The sample container is connected directly to a fixed volume sample loop of 1.0 mL on the GC. Linear range is defined by the calibration curve. Bags are loaded by vacuum.
Normalization	Normalize the mole percent values by multiplying each value by 100 and dividing by the sum of the original values. The sum of the original values should not differ from 100% by more than 1.0%.	Results are not normalized. The sum of the reported values can differ from 100% by as much as 15%, either due to analytical variability or an unusual sample matrix.
Precision	Precision requirements established at each concentration level.	Duplicates should agree within 25% RPD for detections > 5 X's the RL.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per project specific client request the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit.

Per client request, the workorder was reissued on 02/19/16 to remove sample VMP-25-5-110515 from the final report. Sample VMP-25-5-110515 was reported individually in workorder 1511101D.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: VMP-15-5-110415

Lab ID#: 1511101BR1-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	16
Nitrogen	0.27	79
Carbon Dioxide	0.027	5.2

Client Sample ID: VMP-15-21.5-110415

Lab ID#: 1511101BR1-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	5.9
Nitrogen	0.28	82
Carbon Dioxide	0.028	12

Client Sample ID: VMP-15-25.5-110415

Lab ID#: 1511101BR1-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	7.1
Nitrogen	0.24	81
Carbon Dioxide	0.024	12

Client Sample ID: VMP-15-29-110415

Lab ID#: 1511101BR1-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	9.2
Nitrogen	0.26	80
Carbon Dioxide	0.026	11

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Client Sample ID: VMP-15-5-110415

Lab ID#: 1511101BR1-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111108**	**Date of Collection: 11/4/15 2:19:00 PM**	
Dil. Factor:	**2.72**	**Date of Analysis: 11/11/15 09:31 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	16
Nitrogen	0.27	79
Carbon Monoxide	0.027	Not Detected
Methane	0.00027	Not Detected
Carbon Dioxide	0.027	5.2
Ethane	0.0027	Not Detected
Ethene	0.0027	Not Detected
Helium	0.14	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-21.5-110415

Lab ID#: 1511101BR1-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111109**	**Date of Collection: 11/4/15 2:35:00 PM**	
Dil. Factor:	**2.78**	**Date of Analysis: 11/11/15 09:54 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	5.9
Nitrogen	0.28	82
Carbon Monoxide	0.028	Not Detected
Methane	0.00028	Not Detected
Carbon Dioxide	0.028	12
Ethane	0.0028	Not Detected
Ethene	0.0028	Not Detected
Helium	0.14	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-25.5-110415

Lab ID#: 1511101BR1-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111110**	**Date of Collection: 11/4/15 2:56:00 PM**	
Dil. Factor:	**2.45**	**Date of Analysis: 11/11/15 10:23 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	7.1
Nitrogen	0.24	81
Carbon Monoxide	0.024	Not Detected
Methane	0.00024	Not Detected
Carbon Dioxide	0.024	12
Ethane	0.0024	Not Detected
Ethene	0.0024	Not Detected
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: VMP-15-29-110415

Lab ID#: 1511101BR1-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111111**	**Date of Collection: 11/4/15 3:14:00 PM**	
Dil. Factor:	**2.58**	**Date of Analysis: 11/11/15 10:52 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	9.2
Nitrogen	0.26	80
Carbon Monoxide	0.026	Not Detected
Methane	0.00026	Not Detected
Carbon Dioxide	0.026	11
Ethane	0.0026	Not Detected
Ethene	0.0026	Not Detected
Helium	0.13	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: Lab Blank

Lab ID#: 1511101BR1-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/10/15 10:06 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	Not Detected
Nitrogen	0.10	Not Detected
Carbon Monoxide	0.010	Not Detected
Methane	0.00010	Not Detected
Carbon Dioxide	0.010	Not Detected
Ethane	0.0010	Not Detected
Ethene	0.0010	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: Lab Blank

Lab ID#: 1511101BR1-06B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111105c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/10/15 10:28 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Helium	0.050	Not Detected

Container Type: NA - Not Applicable

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1511101BR1-07A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/10/15 09:08 PM**	

Compound	%Recovery	Method Limits
Oxygen	100	85-115
Nitrogen	93	85-115
Carbon Monoxide	96	85-115
Methane	108	85-115
Carbon Dioxide	100	85-115
Ethane	107	85-115
Ethene	108	85-115
Helium	104	85-115

Container Type: NA - Not Applicable

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1511101BR1-07AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111125**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/15 06:56 PM**	

Compound	%Recovery	Method Limits
Oxygen	100	85-115
Nitrogen	93	85-115
Carbon Monoxide	95	85-115
Methane	109	85-115
Carbon Dioxide	100	85-115
Ethane	108	85-115
Ethene	109	85-115
Helium	104	85-115

Container Type: NA - Not Applicable